



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8**

1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
<http://www.epa.gov/region08>


1191818 - R8 SDMS

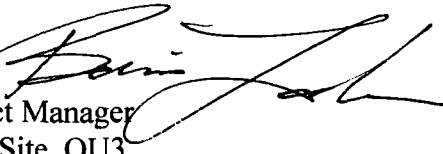
Ref: 8EPR-SR

January 28, 2011

MEMORANDUM

SUBJECT: January 25, 2011 Conference Call: Presentation of the January 24, 2011 Initial Screening Level Human Health Risk Assessment for Exposure to Asbestos, Libby OU3

FROM: Bonnie Lavelle
Remedial Project Manager
Libby Asbestos Site, OU3

A handwritten signature in black ink, appearing to read "Bonnie Lavelle", is written over the typed name and title.

TO: Site File

The attached documents provide the record of a conference call conducted by EPA on January 25, 2011 to present the results of a screening level human health risk assessment for exposure to asbestos in OU3 of the Libby Asbestos Site.

Participants in the conference call were:

- Bonnie Lavelle, EPA RPM
- Bill Brattin, SRC, Inc., contractor to EPA
- Malcolm Edwards, US Forest Service
- Charlie Webster, US Forest Service
- Nikia Hernandez, US Forest Service
- Bob Marriam, Remedium
- Bob Medler, Remedium
- Dick Sloan, Project Manager, MDEQ

attachments



Libby OU3 project - conference call

Bonita Lavelle to: cwebster, medwards01, Robert.R.Marriam,
Medler, Robert J., rsloan

01/19/2011 03:15 PM

Hi everyone,

I'm pleased to inform you that EPA has performed preliminary calculations of the risk to humans associated with exposure to Libby Amphibole asbestos during recreational activities, US Forest Service forest management activities, residential wood harvesting and firefighting in the Kootenai National Forest area of OU3 of the Libby Asbestos Site.

We used all the activity-based-sampling (ABS) data collected over the last 2 years (2009 and 2010) in the calculations and the methods and results are summarized in an EPA document that I plan to transmit to each of you for delivery on Monday January 24.

Please note that for several reasons, this document is not the final baseline risk assessment for OU3. The purpose of this effort was to communicate what EPA knows about the magnitude of the risks associated with use of the forested areas of OU3 and to identify any significant gaps in the information so that we can plan for additional data collection efforts in 2011, if necessary.

I would like to schedule a conference call to walk you all through the main points and conclusions of the risk assessment. It's not necessary for you to have read the document before we talk - the call is intended to assist you in your review.

Are you available for a conference call on Tuesday, January 25 at 10:00 AM mountain time?

call-in number is: 1-866-299-3188
code: 303-312-6579

If that date and time are not convenient, please let me know some alternate times. I'm open Tuesday January 25 after 2 PM, or anytime Thursday January 27 or Friday January 28.

I'm looking forward to talking to all of you - thank you for all your efforts in support of this work.

Sincerely,

Bonnie Lavelle
Remedial Project Manager
Libby Asbestos Superfund Site, OU3
EPA Region 8
1595 Wynkoop Street
8EPR-SR
Denver, CO 80202-1129

(303) 312-6579
Fax (303) 312-7151



Re: Libby OU3 project - conference call

Charlie Webster

to:

Bonita Lavelle

01/20/2011 08:01 AM

Cc:

medwards01, "Medler, Robert J.", Robert.R.Marriam, rsloan

Show Details

Bonnie, thanks for getting this accomplished. I am available at 1000 on the 25th and will be on the call. The other dates could also work for me. Charlie

Charlie Webster

Kootenai NF Fire Management Officer

(406) 283 - 7733

cwebster@fs.fed.us

Lavelle.Bonita@epamail.epa.gov

To cwebster@fs.fed.us, medwards01@fs.fed.us, Robert.R.Marriam@grace.com,

"Medler, Robert J." <Robert.J.Medler@grace.com>, rsloan@mt.gov

01/19/2011 03:15 PM

cc

Subject Libby OU3 project - conference call

Hi everyone,

I'm pleased to inform you that EPA has performed preliminary calculations of the risk to humans associated with exposure to Libby Amphibole asbestos during recreational activities, US Forest Service forest management activities, residential wood harvesting and firefighting in the Kootenai National Forest area of OU3 of the Libby Asbestos Site.

We used all the activity-based-sampling (ABS) data collected over the last 2 years (2009 and 2010) in the calculations and the methods and results are summarized in an EPA document that I plan to transmit to each of you for delivery on Monday January 24.

Please note that for several reasons, this document is not the final baseline risk assessment for OU3. The purpose of this effort was to communicate what EPA knows about the magnitude of the risks associated with use of the forested areas of OU3 and to identify any significant gaps in the information so that we can plan for additional data collection efforts in 2011, if necessary.

I would like to schedule a conference call to walk you all through the main points and conclusions of the risk assessment. It's not necessary for you to have read the document before we talk - the call is intended to assist you in your review.

Are you available for a conference call on Tuesday, January 25 at 10:00 AM mountain time?

call-in number is: 1-866-299-3188
code: 303-312-6579

If that date and time are not convenient, please let me know some alternate times. I'm open Tuesday January 25 after 2 PM, or anytime Thursday January 27 or Friday January 28.

I'm looking forward to talking to all of you - thank you for all your efforts in support of this work.

Sincerely,

Bonnie Lavelle
Remedial Project Manager
Libby Asbestos Superfund Site, OU3
EPA Region 8
1595 Wynkoop Street
8EPR-SR
Denver, CO 80202-1129

(303) 312-6579
Fax (303) 312-7151



RE: Libby OU3 project - conference call

Medler, Robert J. to: Bonita Lavelle, cwebster, medwards01,
Marriam, Robert R., rsloan

01/20/2011 07:05 AM

Cc: "Gardner, Lynne G."

I am available 1/25 or either of the other dates.

-----Original Message-----

From: Lavelle.Bonita@epamail.epa.gov

[mailto:Lavelle.Bonita@epamail.epa.gov]

Sent: Wednesday, January 19, 2011 4:15 PM

To: cwebster@fs.fed.us; medwards01@fs.fed.us; Marriam, Robert R.;

Medler, Robert J.; rsloan@mt.gov

Subject: Libby OU3 project - conference call

Hi everyone,

I'm pleased to inform you that EPA has performed preliminary calculations of the risk to humans associated with exposure to Libby Amphibole asbestos during recreational activities, US Forest Service forest management activities, residential wood harvesting and firefighting in the Kootenai National Forest area of OU3 of the Libby Asbestos Site.

We used all the activity-based-sampling (ABS) data collected over the last 2 years (2009 and 2010) in the calculations and the methods and results are summarized in an EPA document that I plan to transmit to each of you for delivery on Monday January 24.

Please note that for several reasons, this document is not the final baseline risk assessment for OU3. The purpose of this effort was to communicate what EPA knows about the magnitude of the risks associated with use of the forested areas of OU3 and to identify any significant gaps in the information so that we can plan for additional data collection efforts in 2011, if necessary.

I would like to schedule a conference call to walk you all through the main points and conclusions of the risk assessment. It's not necessary for you to have read the document before we talk - the call is intended to assist you in your review.

Are you available for a conference call on Tuesday, January 25 at 10:00 AM mountain time?

call-in number is: 1-866-299-3188
code: 303-312-6579

If that date and time are not convenient, please let me know some alternate times. I'm open Tuesday January 25 after 2 PM, or anytime Thursday January 27 or Friday January 28.

I'm looking forward to talking to all of you - thank you for all your efforts in support of this work.

Sincerely,

Bonnie Lavelle
Remedial Project Manager
Libby Asbestos Superfund Site, OU3
EPA Region 8
1595 Wynkoop Street
8EPR-SR
Denver, CO 80202-1129

(303) 312-6579
Fax (303) 312-7151



RE: Libby OU3 project - conference call

Marriam, Robert R. to: Medler, Robert J., Bonita Lavelle,
cwebster, medwards01, rsloan

01/20/2011 07:14 AM

Cc: "Gardner, Lynne G."

Me too

Robert R. Marriam, Consultant
Remedium Group, Inc.
6401 Poplar Ave., Suite 301
Memphis, TN 38119
901-820-2023 Office
901-277-9031 Cell

-----Original Message-----

From: Medler, Robert J.
Sent: Thursday, January 20, 2011 8:05 AM
To: Lavelle.Bonita@epamail.epa.gov; cwebster@fs.fed.us;
medwards01@fs.fed.us; Marriam, Robert R.; rsloan@mt.gov
Cc: Gardner, Lynne G.
Subject: RE: Libby OU3 project - conference call

I am available 1/25 or either of the other dates.

-----Original Message-----

From: Lavelle.Bonita@epamail.epa.gov
[mailto:Lavelle.Bonita@epamail.epa.gov]
Sent: Wednesday, January 19, 2011 4:15 PM
To: cwebster@fs.fed.us; medwards01@fs.fed.us; Marriam, Robert R.;
Medler, Robert J.; rsloan@mt.gov
Subject: Libby OU3 project - conference call

Hi everyone,

I'm pleased to inform you that EPA has performed preliminary calculations of the risk to humans associated with exposure to Libby Amphibole asbestos during recreational activities, US Forest Service forest management activities, residential wood harvesting and firefighting in the Kootenai National Forest area of OU3 of the Libby Asbestos Site.

We used all the activity-based-sampling (ABS) data collected over the last 2 years (2009 and 2010) in the calculations and the methods and results are summarized in an EPA document that I plan to transmit to each of you for delivery on Monday January 24.

Please note that for several reasons, this document is not the final baseline risk assessment for OU3. The purpose of this effort was to communicate what EPA knows about the magnitude of the risks associated with use of the forested areas of OU3 and to identify any significant gaps in the information so that we can plan for additional data collection efforts in 2011, if necessary.

I would like to schedule a conference call to walk you all through the main points and conclusions of the risk assessment. It's not necessary for you to have read the document before we talk - the call is intended to assist you in your review.

Are you available for a conference call on Tuesday, January 25 at 10:00 AM mountain time?

call-in number is: 1-866-299-3188
code: 303-312-6579

If that date and time are not convenient, please let me know some alternate times. I'm open Tuesday January 25 after 2 PM, or anytime Thursday January 27 or Friday January 28.

I'm looking forward to talking to all of you - thank you for all your efforts in support of this work.

Sincerely,

Bonnie Lavelle
Remedial Project Manager
Libby Asbestos Superfund Site, OU3
EPA Region 8
1595 Wynkoop Street
8EPR-SR
Denver, CO 80202-1129

(303) 312-6579
Fax (303) 312-7151



Re: Libby OU3 project - conference call
Malcolm Edwards

to:

Bonita Lavelle

01/19/2011 03:34 PM

Cc:

cwebster, "Medler, Robert J.", Robert.R.Marriam, rsloan

Show Details

tues 1/25 at 10:00 (MST) works ok for me - thanks

Malcolm R Edwards
Libby Ranger District
406 293 7773 (work)
406 334 0253(cell)



Libby OU3 project - conference call material

Bonita Lavelle to: cwebster, medwards01, Robert.R.Marriam,
Medler, Robert J., rsloan

01/24/2011 03:55 PM

Cc: brattin

From: Bonita Lavelle/R8/USEPA/US

To: cwebster@fs.fed.us, medwards01@fs.fed.us, Robert.R.Marriam@grace.com, "Medler, Robert J." <Robert.J.Medler@grace.com>, rsloan@mt.gov

Cc: brattin@srcinc.com

Hi Everyone,

The document, "Libby Asbestos Superfund Site, Operable Unit 3, Initial Screening Level Human Health Risk Assessment for Exposure to Asbestos" will be delivered to each of you by Fed Ex tomorrow.

I look forward to talking with you about the highlights of the document on the call tomorrow.

Here's a power point presentation:



initial risk assessment libby ou3 jan 2011 .ppt

And summary tables:



Tables.pdf

I'll cover this information on the call.

Info again:

Tuesday, January 25 at 10:00 AM mountain time

call-in number is: 1-866-299-3188

code: 303-312-6579

Sincerely,

Bonnie Lavelle
Remedial Project Manager
Libby Asbestos Superfund Site, OU3
EPA Region 8
1595 Wynkoop Street
8EPR-SR
Denver, CO 80202-1129

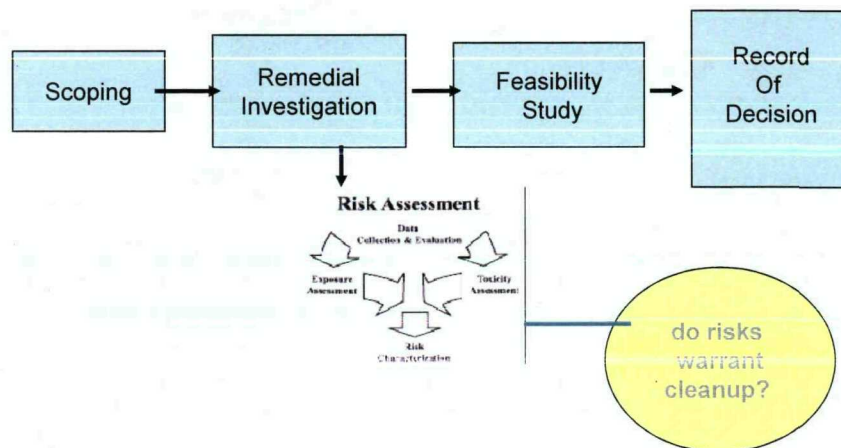
(303) 312-6579

Fax (303) 312-7151

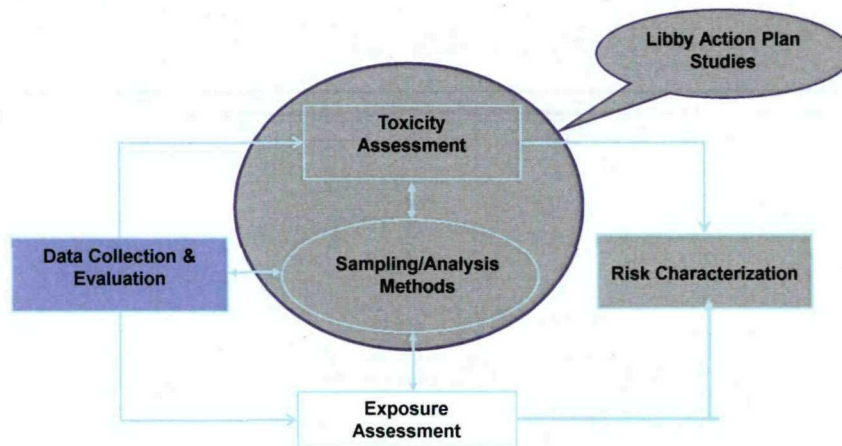
Libby Asbestos Site Operable Unit 3

Initial Screening Level
Human Health Risk Assessment
January 25, 2011

Superfund Decision Framework

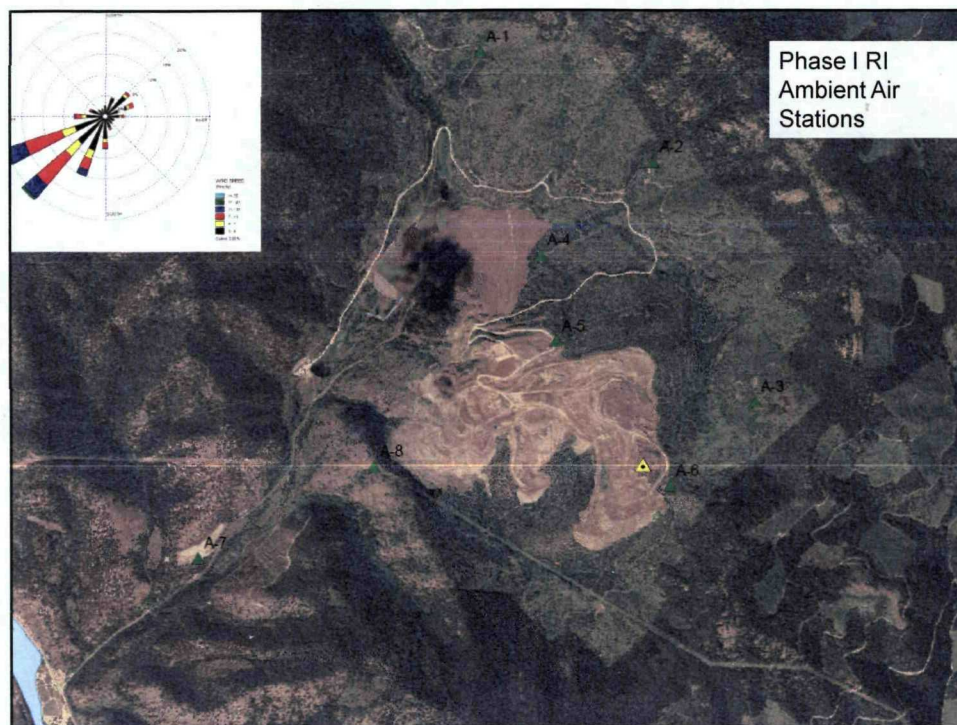


Baseline Risk Assessment



Libby OU3 Exposed Populations

- **General Public**
 - Recreational visitor along Lower Rainy Creek
 - Recreational visitor in National Forest
 - Residential firewood harvester
- **Commercial**
 - Commercial logger
- **Forest Service Workers**
 - Trail Maintenance
 - Stand Examination
 - Tree Thinning
- **Forest Service Fire Fighters**
 - Ground based fire fighter
 - Using hand tools
 - Using heavy equipment
 - Aerial attack fire fighter

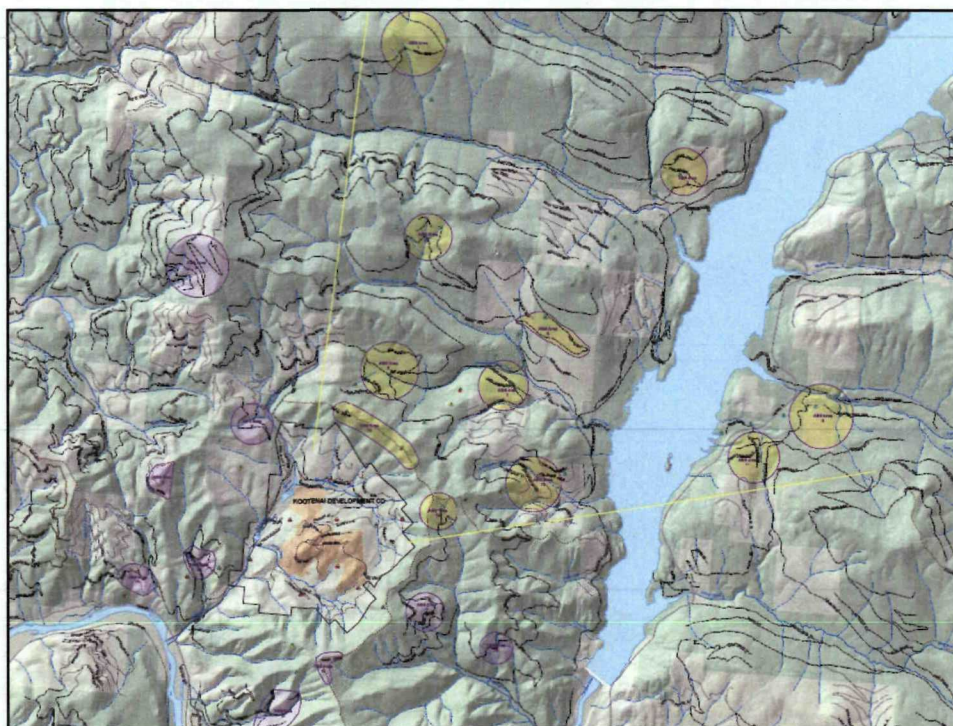


Phase III Activity Based Sampling: Recreational Use Scenario

Personal Breathing Zone Sample 1:
All Terrain Vehicle Riding – 20 minutes

Personal Breathing Zone Sample 2:
Hiking – 80 minutes

Personal Breathing Zone Sample 3:
Collecting Firewood – 10 minutes
Preparing a Campfire Site – 5 minutes
Building and Sitting Near a Campfire – 20 minutes



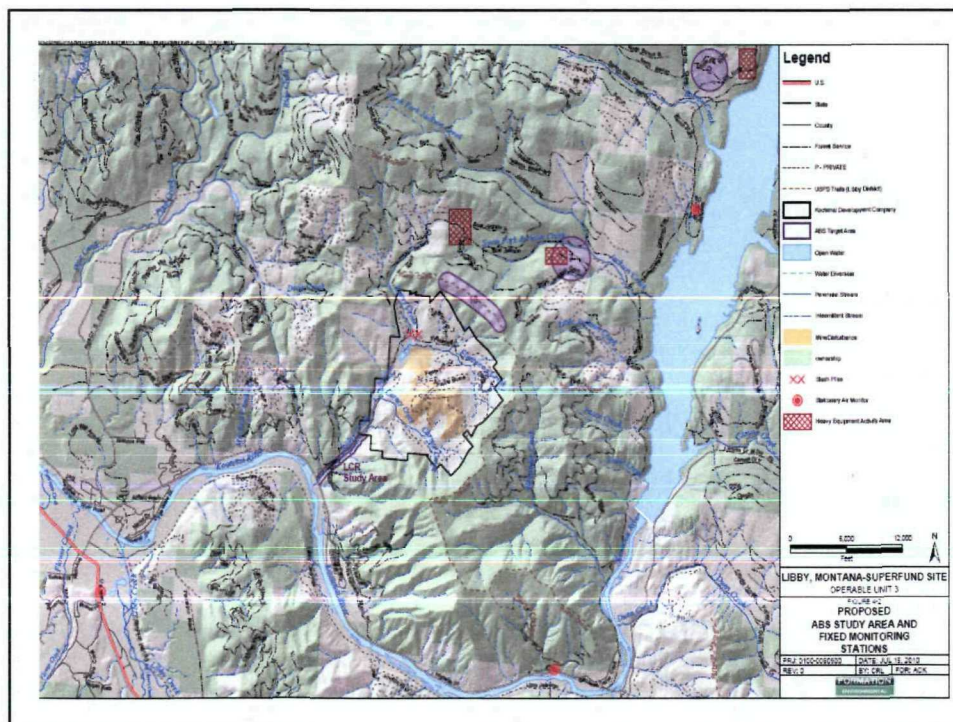
Phase IV Activity Based Sampling Scenarios

• **General Public**

- Recreational use along Lower Rainy Creek
- Harvesting firewood

• **Forest Service**

- Trail Maintenance
- Stand Examination
- Tree Thinning
- Cutting fire lines (w/o smoke)
 - By hand
 - By equipment
- Exposure to smoke during controlled burn
- Exposure of pilots to smoke during wildfires





$$\text{RISK} = (\text{EPC}) \times (\text{TWF}) \times (\text{IUR}_{\text{A,D}})$$

EPC = exposure point concentration of asbestos in air; an estimate of the long term average concentration in inhaled air for the specific activity being assessed

TWF = time weighting factor

IUR = **unit risk** based on continuous exposure beginning at age "a" and continuing for a duration of "d"

Methodology

- EPC: exposure point concentration
 - Calculated two ways
 - Best estimate: average of samples collected at a location, non-detects are given a value of "0"
 - Conservative Bound: average of samples collected at a location, non-detects are assumed to be less than one structure times the analytical sensitivity

Exposure Parameters

TABLE S-1
SCREENING LEVEL EXPOSURE PARAMETERS

Panel A: Outdoor Activities

Exposed Population	Exposure Scenario	ET (hrs/day)	EF (days/yr)
Recreational visitor	Passive activities (ambient air)	8	50
	Hiking/camping in forested area	8	50
	Hiking along Rainy Creek	4	20
Residential wood harvester	Cutting and hauling firewood	8	10
USFS Worker	Forest management	8	30
USFS Firefighter	Cutting firelines	8	30

Panel B: Driving Scenario

Exposed Population	Exposure Scenario	ET (hrs/day)	EF (days/yr)
Recreational visitor	Passive activities (ambient air)	1	50
	Hiking/camping in forested area	1	50
	Hiking along Rainy Creek	0	20
Residential wood harvester	Cutting and hauling firewood	1	10
USFS Worker	Forest management	1	30
USFS Firefighter	Cutting firelines	1	30

Exposure Parameters (cont.)

TABLE S-2
SCREENING LEVEL UNIT RISK VALUES

Exposed Population	Exposure Scenario	Age at first exposure (yrs)	Exposure Duration (yrs)	ICR _{2,d} (PCM 6-yr α) ⁻¹
Recreational visitor	Passive activities (ambient air)	7	40	0.1448
	Hiking/camping in forested area	7	40	0.1448
	Hiking along Rainy Creek	7	40	0.1448
Residential wood harvester	Cutting and hauling firewood	18	40	0.0902
USFS Worker	Forest management	18	40	0.0902
	Cutting firelines	18	40	0.0902

Combined Screening Level Risks from Driving and Outdoor Activities

TABLE S-10
COMBINED SCREENING LEVEL RISKS FROM DRIVING AND OUTDOOR

Exposed Population	Exposure Scenario	Screening Level Cancer Risk	
		Best Est.	Conserv. Bound
Recreational visitor	Passive activities (ambient air)	1.1E-06	< 3.2E-05
	Hiking/camping in forested area	6.0E-06	< 6.9E-05
	Hiking along Rainy Creek	3.1E-05	< 3.3E-05
Residential wood	Cutting and hauling firewood	2.4E-06	< 1.2E-05
USFS Worker	Forest management	1.5E-06	< 4.2E-05
	Cutting firelines	2.2E-05	< 4.9E-05

The role of Risk Assessment in Superfund

- EPA uses the risk assessment to establish the basis for taking a remedial action.
- Generally, where the risk assessment indicates cumulative cancer risk greater than 1/10,000 using "reasonable maximum" exposure assumptions, action is warranted.
- Where cumulative cancer risk is less than 1/10,000, action may be warranted if:
 - non-cancer risks are unacceptably high
 - ecological risks are unacceptably high
 - standards that define acceptable risk are exceeded

Uncertainties

- Uncertainty in measurements of LA in inhaled air
- Use of indirect preparation technique
- Two exposure scenarios not evaluated
- Lack of EPA-approved non-cancer inhalation toxicity factor for LA
- Assumptions about human exposure
- Cancer exposure-response relationship
- Cumulative exposures

**TABLE 3-1
SUMMARY OF EPA STUDIES OF LA IN OU3 AIR**

RI Phase	Exposed Population	Exposure Scenario	Number of Locations	Events per Location	Samples per Event	Target Samples	Number of Samples			SAP
							Collected	Analyzed		
								Direct	Indirect	
I	All	Ambient air	8	4	1	32	32	32	--	EPA 2007
II	All	Ambient air	8	8	1	64	64	64	--	EPA 2008
III	Recreational visitor	ATV Riding in forested area	11	8	2	176	152	76 (a)	--	EPA 2009
		Hiking in forested area	11	8	2	176	148	74 (a)	--	
		Fire building/burning	11	8	2	176	152	76 (a)	--	
IV	Recreational visitor	Hiking along Rainy Creek	1	5	2	10	10	3	7	EPA 2010
	Residential wood harvester	Driving to and from harvest area	3	5	2	30	30	27	3	
		Cutting and hauling firewood	3	1	2	6	6	2	4	
		Felling and limbing	3	4	2	24	32	4	28	
		Cutting and stacking	3	4	2	24	24	10	14	
	USFS Worker (forest management activities)	Trail maintenance	3	5	2	30	30	21	9	
		Thinning trees	3	5	2	30	30	15	15	
		Stand exam	3	5	2	30	30	24	6	
	USFS Firefighter (ground-based)	Cutting firelines by hand	3	5	2	30	30	16	14	
Cutting firelines with heavy equipment		3	5	2	30	30	8	22		

(a) Only samples from one individual were planned for analysis. The remaining samples are held in archive, if needed.

TABLE 5-1
SCREENING LEVEL EXPOSURE PARAMETERS

Panel A: Outdoor Activities

Exposed Population	Exposure Scenario	ET (hrs/day)	EF (days/yr)	TWF --
Recreational visitor	Passive activities (ambient air)	8	50	0.0457
	Hiking/camping in forested area	8	50	0.0457
	Hiking along Rainy Creek	4	20	0.0091
Residential wood harvester	Cutting and hauling firewood	8	10	0.0091
USFS Worker	Forest management	8	30	0.0274
USFS Firefighter	Cutting firelines	8	30	0.0274

Panel B: Driving Scenario

Exposed Population	Exposure Scenario	ET (hrs/day)	EF (days/yr)	TWF --
Recreational visitor	Passive activities (ambient air)	1	50	0.0057
	Hiking/camping in forested area	1	50	0.0057
	Hiking along Rainy Creek	0	20	0.0000
Residential wood harvester	Cutting and hauling firewood	1	10	0.0011
USFS Worker	Forest management	1	30	0.0034
USFS Firefighter	Cutting firelines	1	30	0.0034

TABLE 5-2
SCREENING LEVEL UNIT RISK VALUES

Exposed Population	Exposure Scenario	Age at first exposure (yrs)	Exposure Duration (yrs)	IUR _{a,d} (PCM f-yrs/cc) ⁻¹
Recreational visitor	Passive activities (ambient air)	7	40	0.1448
	Hiking/camping in forested area	7	40	0.1448
	Hiking along Rainy Creek	7	40	0.1448
Residential wood harvester	Cutting and hauling firewood	18	40	0.0902
USFS Worker	Forest management	18	40	0.0902
	Cutting firelines	18	40	0.0902

TABLE 5-3
SCREENING LEVEL RISKS FOR PASSIVE EXPOSURES (AMBIENT AIR)

Panel A: Best Estimate

Station ID	EPC (PCME s/cc)			Screening Level Cancer Risk		
	Phase I	Phase II	Combined	Phase I	Phase II	Combined
A-1	0.00000		0.00000	0.0E+00		0.0E+00
A-2	0.00000		0.00000	0.0E+00		0.0E+00
A-3	0.00000		0.00000	0.0E+00		0.0E+00
A-4	0.00000	0.00000	0.00000	0.0E+00	0.0E+00	0.0E+00
A-5	0.00000	0.00060	0.00040	0.0E+00	4.0E-06	2.6E-06
A-6	0.00000	0.00006	0.00004	0.0E+00	4.2E-07	2.8E-07
A-7	0.00000		0.00000	0.0E+00		0.0E+00
A-8	0.00000	0.00000	0.00000	0.0E+00	0.0E+00	0.0E+00
A-9		0.00096	0.00096		6.4E-06	6.4E-06
A-10		0.00000	0.00000		0.0E+00	0.0E+00
A-11		0.00045	0.00045		3.0E-06	3.0E-06
A-12		0.00000	0.00000		0.0E+00	0.0E+00
All	0.00000	0.00026	0.00017	0.0E+00	1.7E-06	1.1E-06

Panel B: Conservative Bound

Station ID	EPC (PCME s/cc)			Screening Level Cancer Risk		
	Phase I	Phase II	Combined	Phase I	Phase II	Combined
A-1	< 0.00053		< 0.00053	< 3.5E-06		< 3.5E-06
A-2	< 0.00053		< 0.00053	< 3.5E-06		< 3.5E-06
A-3	< 0.00053		< 0.00053	< 3.5E-06		< 3.5E-06
A-4	< 0.00055	< 0.00052	< 0.00053	< 3.6E-06	< 3.4E-06	< 3.5E-06
A-5	< 0.00055	< 0.00091	< 0.00079	< 3.6E-06	< 6.0E-06	< 5.2E-06
A-6	< 0.00053	< 0.00053	< 0.00053	< 3.5E-06	< 3.5E-06	< 3.5E-06
A-7	< 0.00053		< 0.00053	< 3.5E-06		< 3.5E-06
A-8	< 0.00061	< 0.00054	< 0.00056	< 4.0E-06	< 3.6E-06	< 3.7E-06
A-9		< 0.00134	< 0.00134		< 8.9E-06	< 8.9E-06
A-10		< 0.00056	< 0.00056		< 3.7E-06	< 3.7E-06
A-11		< 0.00084	< 0.00084		< 5.6E-06	< 5.6E-06
A-12		< 0.00053	< 0.00053		< 3.5E-06	< 3.5E-06
All	< 0.00055	< 0.00072	< 0.00066	< 3.6E-06	< 4.8E-06	< 4.4E-06

TWF 0.0457
IURa,d 0.1448 (PCM f-yrs/cc)⁻¹

TABLE 5-4
SCREENING LEVEL RISKS TO RECREATIONAL FOREST VISITORS

Scenario	ABS Area	Best Estimate		Conservative Bound	
		EPC (PCME s/cc)	Screening Level Cancer Risk	EPC (PCME s/cc)	Screening Level Cancer Risk
ATV Riding	ABS-01	0.0000	0.0E+00	< 0.0060	< 4.0E-05
	ABS-02	0.0000	0.0E+00	< 0.0060	< 4.0E-05
	ABS-03	0.0017	1.1E-05	< 0.0069	< 4.5E-05
	ABS-05	0.0000	0.0E+00	< 0.0060	< 4.0E-05
	ABS-06	0.0000	0.0E+00	< 0.0060	< 4.0E-05
	ABS-07	0.0008	5.0E-06	< 0.0060	< 4.0E-05
	ABS-08	0.0000	0.0E+00	< 0.0060	< 4.0E-05
	ABS-10	0.0030	2.0E-05	< 0.0070	< 4.6E-05
	ABS-11	0.0010	6.6E-06	< 0.0060	< 4.0E-05
	ABS-13	0.0000	0.0E+00	< 0.0060	< 4.0E-05
	ABS-14	0.0000	0.0E+00	< 0.0060	< 4.0E-05
Hiking	ABS-01	0.0000	0.0E+00	< 0.0060	< 4.0E-05
	ABS-02	0.0000	0.0E+00	< 0.0060	< 4.0E-05
	ABS-03	0.0009	5.7E-06	< 0.0069	< 4.5E-05
	ABS-05	0.0009	5.7E-06	< 0.0060	< 4.0E-05
	ABS-06	0.0000	0.0E+00	< 0.0060	< 4.0E-05
	ABS-07	0.0015	9.9E-06	< 0.0060	< 4.0E-05
	ABS-08	0.0000	0.0E+00	< 0.0060	< 4.0E-05
	ABS-10	0.0000	0.0E+00	< 0.0070	< 4.6E-05
	ABS-11	0.0010	6.6E-06	< 0.0060	< 4.0E-05
	ABS-13	0.0000	0.0E+00	< 0.0060	< 4.0E-05
	ABS-14	0.0010	6.6E-06	< 0.0060	< 4.0E-05
Fire Building/Burning	ABS-01	0.0009	5.6E-06	< 0.0060	< 4.0E-05
	ABS-02	0.0009	5.6E-06	< 0.0060	< 4.0E-05
	ABS-03	0.0026	1.7E-05	< 0.0069	< 4.5E-05
	ABS-05	0.0030	2.0E-05	< 0.0060	< 4.0E-05
	ABS-06	0.0025	1.7E-05	< 0.0060	< 4.0E-05
	ABS-07	0.0007	4.9E-06	< 0.0060	< 4.0E-05
	ABS-08	0.0000	0.0E+00	< 0.0060	< 4.0E-05
	ABS-10	0.0050	3.3E-05	< 0.0070	< 4.6E-05
	ABS-11	0.0000	0.0E+00	< 0.0060	< 4.0E-05
	ABS-13	0.0026	1.7E-05	< 0.0060	< 4.0E-05
	ABS-14	0.0000	0.0E+00	< 0.0060	< 4.0E-05
All Activities Combined	ABS-01	0.0003	1.9E-06	< 0.0060	< 4.0E-05
	ABS-02	0.0003	1.9E-06	< 0.0060	< 4.0E-05
	ABS-03	0.0017	1.1E-05	< 0.0069	< 4.5E-05
	ABS-05	0.0013	8.5E-06	< 0.0060	< 4.0E-05
	ABS-06	0.0008	5.6E-06	< 0.0060	< 4.0E-05
	ABS-07	0.0010	6.6E-06	< 0.0060	< 4.0E-05
	ABS-08	0.0000	0.0E+00	< 0.0060	< 4.0E-05
	ABS-10	0.0027	1.8E-05	< 0.0070	< 4.6E-05
	ABS-11	0.0007	4.4E-06	< 0.0060	< 4.0E-05
	ABS-13	0.0009	5.6E-06	< 0.0060	< 4.0E-05
	ABS-14	0.0003	2.2E-06	< 0.0060	< 4.0E-05
All Areas, All Activities		0.0009	6.0E-06	< 0.0062	< 4.1E-05

TWF 0.0457

IURa,d 0.1448 (PCM f-yrs/cc)⁻¹

TABLE 5-5
SCREENING LEVEL RISKS TO HIKERS ON
LOWER RAINY CREEK

Scenario	ABS Area	Best Estimate		Conservative Bound	
		EPC (PCME s/cc)	Screening Level Cancer Risk	EPC (PCME s/cc)	Screening Level
Hiking	Lower Rainy	0.0234	3.1E-05	< 0.0253	< 3.3E-05

TWF 0.0091

IURa,d 0.1448 (PCM f-yrs/cc)⁻¹

TABLE 5-6
SCREENING LEVEL RISKS TO RESIDENTIAL WOOD HARVESTER

Scenario	Location	Best Estimate		Conservative Bound	
		EPC (PCME s/cc)	Screening Level Cancer	EPC (PCME s/cc)	Screening Level Cancer Risk
Cutting and hauling firewood	ABS-10	0.0047	3.9E-06	0.0047	3.9E-06
	ABS-07	0.0101	8.3E-06	< 0.0124	< 1.0E-05
	ABS-02	0.0000	0.0E+00	< 0.0077	< 6.3E-06
Felling and limbing	ABS-10	0.0000	0.0E+00	< 0.0096	< 7.9E-06
	ABS-07	0.0074	6.1E-06	< 0.0118	< 9.7E-06
	ABS-02	0.0006	5.1E-07	< 0.0132	< 1.1E-05
Cutting and stacking	ABS-10	0.0000	0.0E+00	< 0.0114	< 9.4E-06
	ABS-07	0.0035	2.9E-06	< 0.0084	< 6.9E-06
	ABS-02	0.0000	0.0E+00	< 0.0153	< 1.3E-05
Combined	ABS-10	0.0016	1.3E-06	< 0.0086	< 7.0E-06
	ABS-07	0.0070	5.8E-06	< 0.0109	< 9.0E-06
	ABS-02	0.0002	1.7E-07	< 0.0121	< 9.9E-06
All Areas, All Activities		0.0029	2.4E-06	< 0.0105	< 8.6E-06

TWF 0.0091
IURa,d 0.0902 (PCM f-yrs/cc)⁻¹

TABLE 5-7
SCREENING LEVEL RISKS TO USFS WORKERS

Scenario	Location	Best Estimate		Conservative Bound	
		EPC (PCME s/cc)	Screening Level Cancer Risk	EPC (PCME s/cc)	Screening Level Cancer Risk
Trail maintenance	ABS-10	0.0000	0.0E+00	< 0.0166	< 4.1E-05
	ABS-07	0.0015	3.7E-06	< 0.0152	< 3.8E-05
	ABS-02	0.0008	1.9E-06	< 0.0164	< 4.0E-05
Thinning trees	ABS-10	0.0000	0.0E+00	< 0.0144	< 3.6E-05
	ABS-07	0.0008	1.9E-06	< 0.0113	< 2.8E-05
	ABS-02	0.0008	1.9E-06	< 0.0152	< 3.8E-05
Stand exam	ABS-10	0.0000	0.0E+00	< 0.0082	< 2.0E-05
	ABS-07	0.0016	4.0E-06	< 0.0095	< 2.3E-05
	ABS-02	0.0000	0.0E+00	< 0.0088	< 2.2E-05
Combined	ABS-10	0.0000	0.0E+00	< 0.0131	< 3.2E-05
	ABS-07	0.0013	3.2E-06	< 0.0120	< 3.0E-05
	ABS-02	0.0005	1.2E-06	< 0.0134	< 3.3E-05
All Areas, All Activities		0.0006	1.5E-06	< 0.0128	< 3.2E-05

TWF 0.0274
IURa,d 0.0902 (PCM f-yrs/cc)⁻¹

TABLE 5-8
SCREENING LEVEL RISKS TO USFS FIREFIGHTERS

Scenario	Location	Best Estimate		Conservative Bound	
		EPC (PCME s/cc)	Screening Level Cancer Risk	EPC (PCME s/cc)	Screening Level Cancer Risk
Cutting firelines by hand	ABS-10	0.0000	0.0E+00	< 0.0116	< 2.9E-05
	ABS-07	0.0267	6.6E-05	< 0.0318	< 7.9E-05
	ABS-02	0.0106	2.6E-05	< 0.0155	< 3.8E-05
Cutting firelines with heavy equipment	ABS-10	0.0052	1.3E-05	< 0.0105	< 2.6E-05
	ABS-07	0.0072	1.8E-05	< 0.0107	< 2.7E-05
	ABS-02	0.0039	9.7E-06	< 0.0132	< 3.3E-05
Combined	ABS-10	0.0026	6.4E-06	< 0.0110	< 2.7E-05
	ABS-07	0.0170	4.2E-05	< 0.0213	< 5.3E-05
	ABS-02	0.0073	1.8E-05	< 0.0144	< 3.5E-05
All Areas, All Activities		0.0089	2.2E-05	< 0.0156	< 3.8E-05

TWF 0.0274
IURa,d 0.0902 (PCM f-yrs/cc)⁻¹

TABLE 5-9
SCREENING LEVEL RISKS FROM DRIVING ON ROADS

Exposed Population	Exposure Scenario	Best Estimate		Conservative Bound	
		EPC (a) (PCME s/cc)	Screening Level Cancer	EPC (b) (PCME s/cc)	Screening Level Cancer Risk
Recreational visitor	Passive activities (ambient air)	0	0.0E+00	< 0.0338	< 2.8E-05
Recreational visitor	Hiking/camping in forested area	0	0.0E+00	< 0.0338	< 2.8E-05
Recreational visitor	Hiking along Rainy Creek	NA		NA	
Residential wood harvester	Cutting and hauling firewood	0	0.0E+00	< 0.0338	< 3.5E-06
USFS Worker	Forest management	0	0.0E+00	< 0.0338	< 1.0E-05
USFS Firefighter	Cutting firelines	0	0.0E+00	< 0.0338	< 1.0E-05

NA = not applicable

(a) EPC is based on the average of 30 samples collected while driving to and from three different locations in OU3

(b) EPC is based on the average of the analytical sensitivity for 30 samples collected while driving to and from three different locations in OU3

TABLE 5-10
COMBINED SCREENING LEVEL RISKS FROM DRIVING AND OUTDOOR

Exposed Population	Exposure Scenario	Screening Level Cancer Risk	
		Best Est.	Conserv. Bound
Recreational visitor	Passive activities (ambient air)	1.1E-06	< 3.2E-05
	Hiking/camping in forested area	6.0E-06	< 6.9E-05
	Hiking along Rainy Creek	3.1E-05	< 3.3E-05
Residential wood	Cutting and hauling firewood	2.4E-06	< 1.2E-05
USFS Worker	Forest management	1.5E-06	< 4.2E-05
	Cutting firelines	2.2E-05	< 4.9E-05

TABLE 6-1
SUMMARY OF INDIRECT PREPARATIONS

RI Phase	Exposed Population	Exposure Scenario	Number of Samples			% Indirect
			Collected	Analyzed		
				Direct	Indirect	
I	All	Ambient air	32	32	0	0%
II	All	Ambient air	64	64	0	0%
III	Recreational visitor	ATV Riding in forested area	152	76	0	0%
		Hiking in forested area	148	74	0	0%
		Fire building/burning	152	76	0	0%
IV	Recreational visitor	Hiking along Rainy Creek	10	3	7	70%
	Residential wood harvester	Driving to and from harvest area	30	27	3	10%
		Cutting and hauling firewood	6	2	4	67%
		Felling and limbing	32	4	28	88%
		Cutting and stacking	24	10	14	58%
	USFS Worker (forest management activities)	Trail maintenance	30	21	9	30%
		Thinning trees	30	15	15	50%
		Stand exam	30	24	6	20%
	USFS Firefighter (ground-based)	Cutting firelines by hand	30	16	14	47%
Cutting firelines with heavy equipment		30	8	22	73%	